**Chapter 585: DISSOLVED OXYGEN REQUIREMENTS FOR RIVERS AND STREAMS**

SUMMARY: Maine's Water Classification Program standards (38 MRSA § 465) require that all classes of fresh surface water be of suitable quality for the designated uses of fishing, habitat for fish and other aquatic life, and support of indigenous species of fish, the latter including maintenance of the critical life functions of survival, growth and reproduction. Numeric dissolved oxygen criteria currently specified in the standards are protective of short term survival and of reproduction in some waters, but additional criteria are necessary for adequate growth and reproduction to ensure complete attainment of the standards in all fresh surface waters.

**1. Dissolved oxygen criteria for support of indigenous species of fish.** Concentrations of dissolved oxygen in fresh surface waters not classified as GPA are specifiied by Maine's Water Quality Classification Program standards (38 M.R.S.A. § 465). In addition to specific numeric dissolved oxygen criteria, the standards require that waters be of suitable quality for the designated uses of fishing, habitat for fish and other aquatic life, and support of indigenous species of fish, including maintenance of the critical life functions of survival, growth and reproduction. These narrative standards entail additional dissolved oxygen requirements (Subsection 1B). No person may conduct any activity that alone or in combination with another causes dissolved oxygen concentrations to fall below levels specified in these regulations and described in this section.

**A.** Maine's Water Classification Program standards require that dissolved oxygen levels for each class must be the higher of the minimum concentration for the class or the concentration of the minimum percent saturation for the class. These levels are: Class AA, as naturally occurs; Class A, 7 mg/liter or 75% saturation; Class B, 7 mg/liter or 75% saturation and Class C, 5 mg/l or 60% saturation. During periods of spawning and egg incubation from October 1 to May 14, Maine's Water Classification Program requirements for dissolved oxygen in designated fish spawning areas for Class B are: a seven day mean of 9.5 mg/liter and a one day minimum of 8.0 mg/liter.

**B.** Ambient levels of dissolved oxygen in fresh waters not classified as GPA may not be less than USEPA's 1986 Quality Criteria for Water, as follows, except when natural conditions cause lower levels to occur.

***Dissolved Oxygen in Water Column (mg/liter)***

| | Early Life Stages (embryo to 30 days posthatch) | Other Life Stages |
|---|---|---|
| 30 day mean | not applicable | **6.5** |
| 7 day mean | **9.5 (6.0)*** | not applicable |
| 7 day mean minimum | not applicable | **5.0** |
| 1 day minimum | **8.0 ( 5.0)*** | this value is superseded by 38 M.R.S.A.§ 465. See subsection 1 A. above. |

*The values in parentheses refer to the 7-day mean or 1-day minimum in non-salmonid spawning areas.

In instances of differences in dissolved oxygen concentration required by Maine's Water Classification Program and that required by USEPA's Quality Criteria for Water, the higher level must be attained.

**2. Identification of fish spawning areas.** Higher levels of dissolved oxygen are required for fish spawning and egg incubation than for other parts of the life cycle (38 M.R.S.A. § 465 ). Therefore, it is necessary to identify spawning areas to ensure adequate oxygen levels in these waters. Prior to licensing or relicensing of any wastewater discharge or any other activity that may affect the dissolved oxygen content of Class B or C waters, the department shall request the Department of Inland Fisheries and Wildlife, the Department of Marine Resources or the Atlantic Salmon Authority to identify fish spawning areas. Such areas must be identified using one or more of the following methods, from most to least preferred.

**A. Identification by observation.** Identification of areas of fish spawning by observation of fishery biologists

**B. Identification through records.** Identification of areas of fish spawning through habitat inventories, river reports, or agency files.

**C. Identification based on habitat.** Identification of areas suitable for fish spawning as indicated by research findings of spawning areas for the same species in other geographical areas, from scientific literature and from habitat suitability models for presently existing species.

**D. Identification based on professional opinion**. Identification of areas suitable for fish spawning based on the professional opinion of a certified fishery biologist experienced in salmonid ecology.

**3. Measurement of dissolved oxygen in riverine impoundments.** Dissolved oxygen criteria apply to all riverine impoundments; i.e., impoundments not classified as GPA. Because sediment may interfere with dissolved oxygen measurements near the bottom, and because incomplete mixing of water layers may result in very low oxygen levels in bottom waters, the department will monitor compliance for dissolved oxygen above 0.5m of the bottom of the impoundment during all periods of time except in portions of the waterbody when it can be: (1) shown that these same portions of the waterbody are hydraulically isolated as a result of thermal stratification, or (2) demonstrated by dye studies or other scientific methods that these same portions of the waterbody are hydraulically isolated as a result of existing natural or artificial structures. For these two exceptions dissolved oxygen will be measured only in portions that are not hydraulically isolated. Hydraulic isolation resulting from a structural barrier may not be the result of dam operation.

"Thermal stratification" for purposes of this section means a change of temperature of at least one degree Celsius per meter of depth, causing waters below this temperature gradient to remain isolated and not to mix with waters higher in the column.

Dissolved oxygen concentrations in bottom waters of riverine impoundments identified in this subsection must not prevent attainment of existing or designated uses of the impoundments.

AUTHORITY: 38 M.R.S.A. Sections 343-A, 464 and 465
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